

# Autonomous Resource Allocation and Task Management for Multi-Spacecraft Formation, Phase I

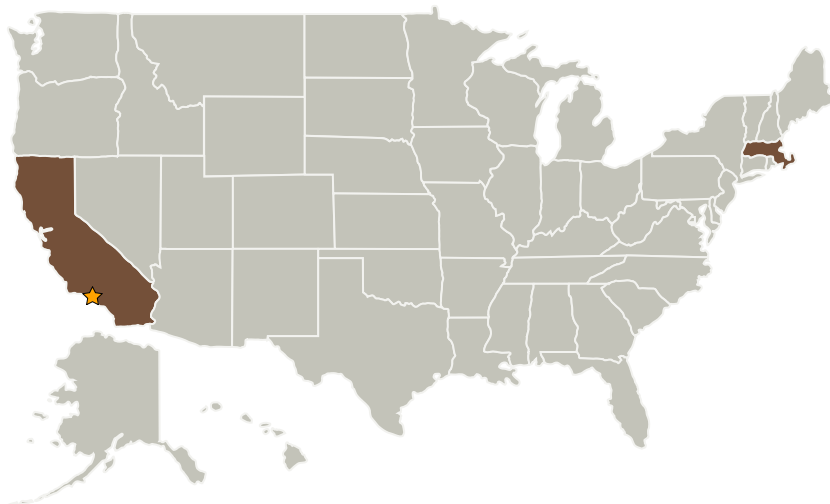
Completed Technology Project (2003 - 2003)



## Project Introduction

Autonomous multiple spacecraft represent a critical enabling technology for future space missions. Currently, significant pre-flight planning and ground tasking are needed to design operational sequences for single-spacecraft missions. Multiple-spacecraft missions (especially formation flying tasks) dramatically increase the complexity of planning, sequencing and tasking, rendering them possibly intractable for current mission design approaches. The overall goal of this effort is to develop an Autonomous Dynamic Formation Planner (ADFP) applicable to multi-spacecraft formation flying tasks, using systematic methodologies for model-based prediction, optimal resource allocation and task/activity sequencing and control. During the proposed effort, SSC will develop and demonstrate an ADFP system for selected multiple-spacecraft formation-flying tasks, using representative constraints for onboard and formation resources. ADFP technology will provide a general framework for implementation of onboard autonomy for future multiple spacecraft missions, which is both resource and constraint-aware. Our project team includes subcontract support from the Research Institute for Advanced Computer Sciences, RIACS (a division of the Universities Space Research Association), and the Colorado Space Grant College (University of Colorado, Boulder).

## Primary U.S. Work Locations and Key Partners



Autonomous Resource Allocation and Task Management for Multi-Spacecraft Formation, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Autonomous Resource Allocation and Task Management for Multi-Spacecraft Formation, Phase I

Completed Technology Project (2003 - 2003)



Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California
Scientific Systems Company, Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Woburn, Massachusetts

## Primary U.S. Work Locations

California	Massachusetts
------------	---------------

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

Carlos Torrez

## Project Manager:

Celestino Jun Rosca

## Principal Investigator:

Ravi Prashanth

## Technology Areas

## Primary:

- TX10 Autonomous Systems
  - └ TX10.2 Reasoning and Acting
    - └ TX10.2.2 Activity and Resource Planning and Scheduling